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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/036,787	10/19/2001	Takayuki Toshima	199372003600	5431

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EXAMINER
CULBERT, ROBERTS P

ART UNIT	PAPER NUMBER
1763	11

DATE MAILED: 05/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/036,787	TOSHIMA ET AL.	
	Examiner	Art Unit	
	Roberts Culbert	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 April 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2,3,6,7 and 17-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2,3,6,7 and 17-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, with respect to the rejections of claim(s) 1-7 have been fully considered but are not persuasive.

2. Applicant has argued that the none of the cited references disclose a an ozone water having a concentration in the range 0.5 to 10 ppm, and an oxidation film having a thickness from 6-10 Å on the surface of the substrate for providing hydrophilicity.

3. The argument is not persuasive because Konuma teaches that a hydrophilic (increased wetting) surface may be obtained on a resist-patterned substrate by using ozone water in the range 0.1 to 20ppm (Col. 5 Lines 30-33). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the range specified by Konuma during the ozone water rinsing step of the claimed invention in order to produce a hydrophilic surface.

4. Changes in temperature, concentrations, or other process conditions of an old process, do not impart patentability unless the recited changes are critical, i.e., they produce a new and unexpected result. See MPEP 2144.05.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art in the instant application.

In the description of the related art, applicant discloses known methods for processing a substrate wafer with a resist pattern and an oxidation film. The known process steps include etching the oxidation film with a chemical liquid (Page 1, Lines 22-25), washing and drying (Page 1, Line 25). Further, it is known to rinse the wafer with ozone water after the etching step to produce a hydrophilic surface and prevent watermarks (Page 1, Lines 30-33). Applicant also teaches that it is old in the art that the wafer may have a patterned resist formed and developed on the wafer, and later removed (Page 1, Col 15-20).

Applicant does not disclose that the method for the substrate with a resist pattern may be carried out in the same chamber as the method for the substrate with no resist pattern. However, it would have been obvious to one of ordinary skill in the art at the time of invention to perform both methods in the same chamber since the process steps needed in both methods overlap. Both methods require the same etching, rinsing, and drying steps. One of ordinary skill in the art would have been motivated to combine the methods in the same processing chamber in order to reduce the materials of construction and associated processing costs.

7. Claims 17-19, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art in view of Konuma.

As applied above, the admitted prior art discloses the method of the invention substantially as claimed, but does not teach ozone water concentration in the range 0.5-10ppm. Konuma teaches that a hydrophilic (increased wetting) surface may be obtained on a resist-patterned substrate by using ozone water in the range 0.1 to 20ppm (Col. 5 Lines 30-33). It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the range specified by Konuma during the ozone water rinsing step of the claimed invention in order to produce a hydrophilic surface.

Regarding claims 18, and 19, the step of forming ozone water by continuously adding ozone water to a rinsing liquid does not define over the prior art. It would have been obvious to one of ordinary skill in the art at the time of invention to mix ozone water with rinsing liquid to form a solution of a desired concentration as indicated by Konuma. One of ordinary skill in the art would be motivated to mix the

ozone water and rinsing liquid by connecting the ozone water line and the rinsing liquid line in order to remove the additional step of pre-mixing a known concentration ozone liquid. Additionally, one of ordinary skill in the art would be motivated to connect the two liquid lines in order to allow the concentration of the ozone water to be adjusted.

8. Claims 2, 3, 6, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art in view of Kamikawa et al.

As applied above, the admitted prior art discloses the method of the invention substantially as claimed, but does not teach the use of drying with a dry gas or by rotation of the substrate (spin drying). Kamikawa et al. teaches that solvent drying, spin drying, and spraying a dry gas such as N_2 are well-known methods for drying a wafer after cleaning (Col. 1 Lines 21-32).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use any of the drying methods suggested by Kamikawa et al. for the purpose of drying the wafer in the method of the claimed invention because Kamikawa et al. teaches that solvent drying, spin drying, and spraying a dry gas such as N_2 are art-recognized equivalents for the purpose of drying a wafer, and it has been held that substitution of one art-recognized equivalent for another is prima facie obvious. *In re Fout*, 297, 213 USPQ 532 (CCPA 1982).

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Roberts Culbert whose telephone number is (703) 305-7965. The examiner can normally be reached on Monday-Friday (7:30-4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on (703) 308-1633. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

April 30, 2003

BENJAMIN L. UTECH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700